What is claimed is:

[Claim 1] An induction tool, comprising:

a conductive mandrel;
at least one array comprising a transmitter, a bucking coil, and a receiver disposed in an insulating tool body surrounding the conductive mandrel; and
an electrode disposed in the insulating tool body at a selected location between the bucking coil and the receiver, wherein the selected location is spaced from the transmitter at a distance corresponding approximately to a harmonic mean of a distance between the transmitter and the bucking coil and a distance between the transmitter and the receiver, and wherein the electrode include a contact forming a conductive path to the conductive mandrel.

[Claim 2] The induction tool of claim 1, wherein the at least one array comprises a transverse array or a triaxial array.

[Claim 3] The induction tool of claim 1, wherein the electrode disposed between the bucking coil and the receiver comprises one selected from a ring electrode, a segmented ring electrode, a fingered electrode, and a plurality of button electrodes arranged around a circumference of the insulating tool body.

[Claim 4] The induction tool of claim 1, wherein the harmonic mean is calculated according to:

$$z_0 = \frac{2}{\frac{1}{z_B} + \frac{1}{z_R}}$$

wherein z_0 is the distance corresponding to the harmonic mean, z_B, and z_R are distances from the transmitter to the bucking coil and the receiver, respectively.

[Claim 5] The induction tool of claim 1, further comprising an additional electrode disposed in the insulating tool body at a distance beyond a receiver

having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.

[Claim 6] The induction tool of claim 1, further comprising a pair of electrodes disposed in the insulating tool body substantially symmetrical about the transmitter, wherein the pair of electrodes each include a conductor that contacts the conductive mandrel.

[Claim 7] The induction tool of claim 6, further comprising an additional electrode disposed in the insulating tool body at a distance beyond a receiver having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.

[Claim 8] The induction tool of claim 6, further comprising a second pair of electrodes disposed in the insulating tool body substantially symmetrical about the transmitter, wherein the second pair of electrodes each include a conductor that contacts the conductive mandrel.

[Claim 9] The induction tool of claim 8, further comprising an additional electrode disposed in the insulating tool body at a distance beyond a receiver having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.

[Claim 10] A method for designing an induction tool, comprising:

disposing at least one array comprising a transmitter, a bucking coil, and a receiver in an insulating tool body surrounding a conductive mandrel of the induction tool;
determining a location of null sensitivity, wherein the location of null sensitivity is located at a harmonic mean of a distance between the transmitter and the bucking coil and a distance between the transmitter and the receiver; and
disposing an electrode in the insulating tool body proximate the location of null sensitivity, wherein a conductive path is formed between the electrode and the conductive mandrel.

[Claim 11] The method of claim 10, wherein the at least one array comprises a transverse array or a triaxial array.

[Claim 12] The method of claim 10, wherein the electrode comprises one selected from a ring electrode, a segmented ring electrode, a fingered electrode, and a plurality of button electrodes arranged around a circumference of the insulating tool body.

[Claim 13] The induction tool of claim 10, wherein the harmonic mean is calculated according to:

$$z_0 = \frac{2}{\frac{1}{z_B} + \frac{1}{z_R}}$$

wherein z_0 is the distance corresponding to the harmonic mean, z_B, and z_R are distances from the transmitter to the bucking coil and the receiver, respectively.

[Claim 14] The method of claim 10, further comprising disposing an additional electrode in the insulating tool body at a distance beyond a receiver having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.

[Claim 15] The method of claim 10, further comprising disposing a pair of electrodes in the insulating tool body substantially symmetrical about the transmitter, wherein the pair of electrodes each include a conductor that contacts the conductive mandrel.

[Claim 16] The method of claim 15, further comprising disposing an additional electrode in the insulating tool body at a distance beyond a receiver having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.

[Claim 17] The method of claim 15, further comprising disposing a second pair of electrodes in the insulating tool body substantially symmetrical about the transmitter, wherein the second pair of electrodes each include a conductor that contacts the conductive mandrel.

[Claim 18] 18. The method of claim 17, further comprising disposing an additional electrode in the insulating tool body at a distance beyond a receiver having a longest spacing from the transmitter, wherein the additional electrode includes a conductor that contacts the conductive mandrel.